

THE MAGNAVOX COMPANY . SERVICE DEPARTMENT

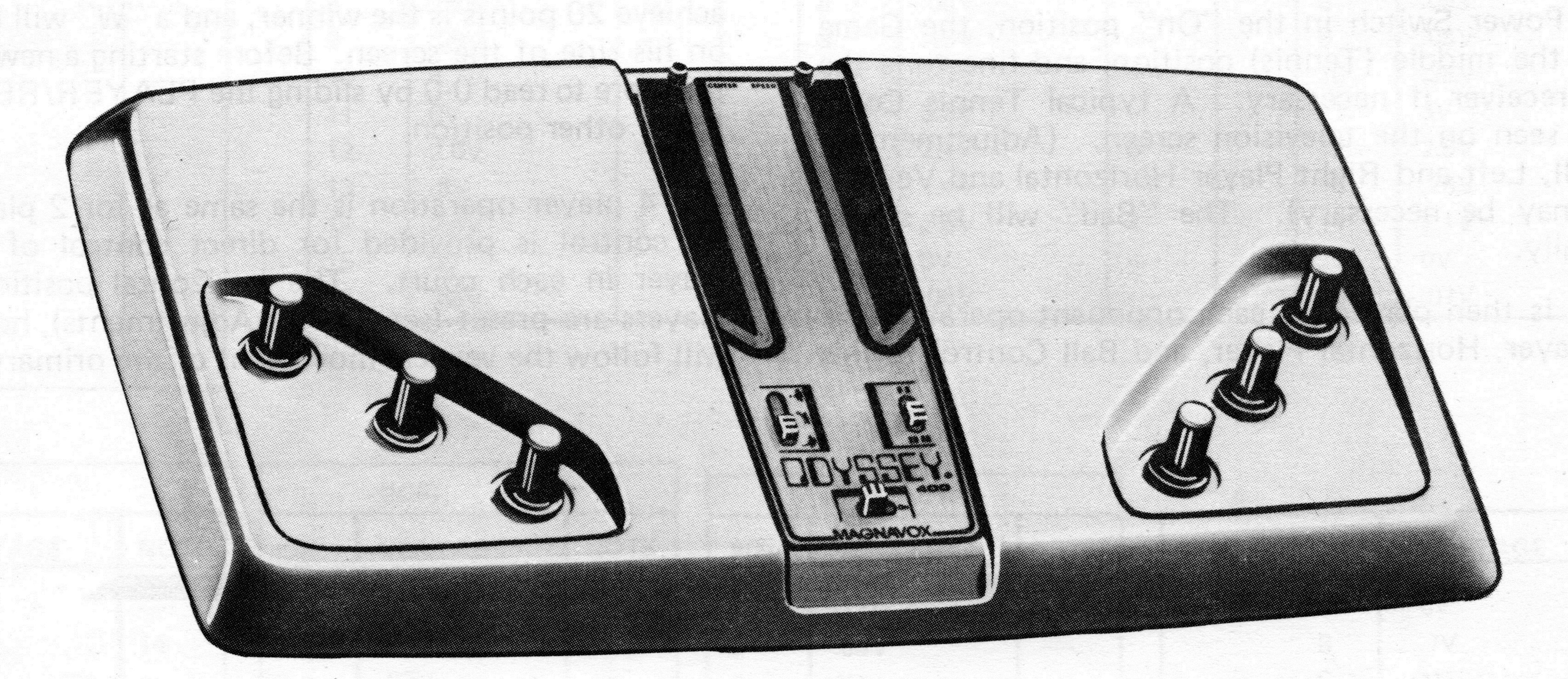
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Miscellaneous Section First Issue: November, 1976

## BG7516 ODYSSEY

## Scanned by Sly DC (2018)



#### GENERAL INFORMATION

The BG7516 can be powered by either 6 "C" cells or an optional AC to DC 9 volt adapter.

The BG7516 has three games, Hockey, Tennis, and Smash,

and as a test of your skill incorporates variable "Ball" (English), Speed Control, and the option of two or four players with Tennis and Hockey. Also incorporated is digital On-Screen scoring.

#### SPECIFICATIONS

	Minimum	Normal	Maximum
Regulated Voltage Supply Measured at Pin 3 of IC1	4.5V	5.0 \text{V}	5.5٧
Current Drain			
BG7516		65Ma	
Vertical Sync			
Frequency	59 Hz	60 Hz	61 Hz
Pulse Amplitude	2.8V	4.00	
Pulse Width	300 usec	317.5 usec	340 usec
Horizontal Sync			
Frequency	15.704 KHz	15.734 KHz	15.784 KHz
Pulse Amplitude	3.5V	4.0\	
Pulse Width	4.0 usec		8.0 usec
RF Carrier Frequency			
Channel 3	61.22 MHz	61.25 MHz	61.28 MHz
Channel 4	67.22 MHz	67.25 MHz	67.28 MHz
RF Output			
Into 300 ohms	1100 uV		1600 uV

#### TYPICAL OPERATION (TENNIS)

Connect the 300 ohm twin lead from the Antenna/ Game Switch to the 300 ohm antenna terminals of a properly adjusted and operating television receiver.

Place the Channel Switch on the Odyssey to either Channel 3 or 4 and the television VHF Channel Selector to the same channel. The Channel Switch on the Odyssey is located to the right of the battery compartment.

Place the Power Switch in the "On" position, the Game Switch to the middle (Tennis) position, and fine tune the television receiver if necessary. A typical Tennis Court should be seen on the television screen. (Adjustment of Center Wall, Left and Right Player Horizontal and Vertical Controls may be necessary). The "Ball" will be served automatically.

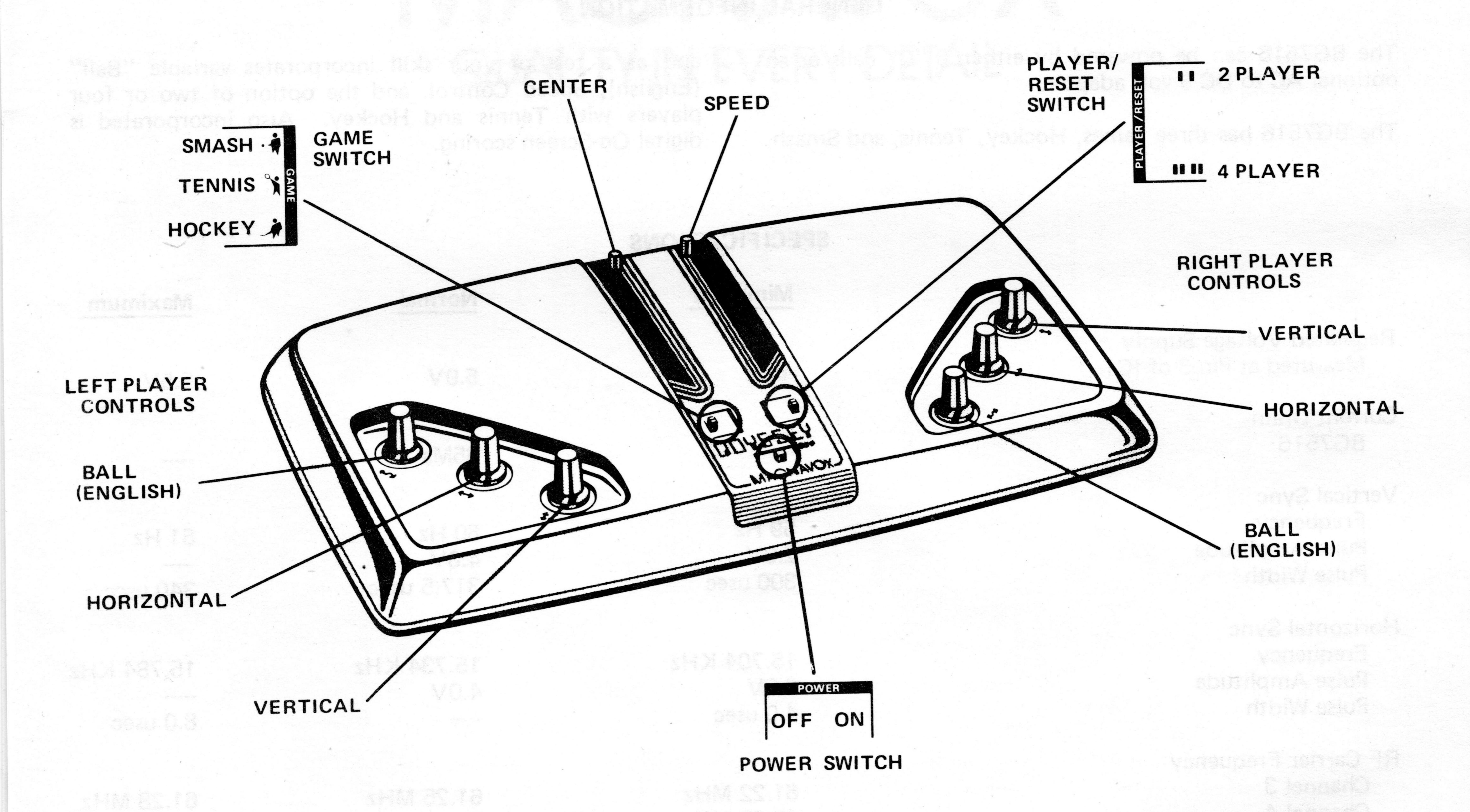
The Game is then played by each opponent operating the Vertical Player, Horizontal Player, and Ball Control for his

side of the court. A rebound circuit keeps the "Ball" from going off the top and bottom of the screen.

The BG7616 uses electronic digital on screen scoring and will appear in the upper middle of the television screen. The score will remain on the screen a short time and then disappear and the "Ball" will automatically serve. Each score will advance digitally until the first contestant to achieve 20 points is the winner, and a "W" will be displayed on his side of the screen. Before starting a new game, reset the score to read 0-0 by sliding the PLAYER/RESET Switch to the other position.

The 4 player operation is the same as for 2 players except no control is provided for direct control of the second player in each court. The horizontal position for these players are preset (see Service Adjustments), however, they will follow the vertical movement of the primary player.

#### TOP VIEW OF BG7516



## VOLTAGE CHARTS IC FUNCTIONS

	(IC1)		
PIN	VOLTAGE	NOTE	
1	0٧		
2	9.6V		
3	5.2V		
4	0٧		
5	2.4V	4	
6	.9٧	4	
7	1.4V	5	
8	0V		
9	.8V		
10	.4٧		
11	3.8V		
12	2.4V		
13	3.6V	7	
14	.1٧		
15	5.3V		
16	.8V		
17	2.9V		
18	2.3V		

(IC2)		
PIN	VOLTAGE	NOTE
1	.4٧	
2	5.3V	
3	3.4V	8
4	2.3V	
5	2.6V	10
6	3.7V	
7	1.5V	
8	.08V	
9	.08V	
10	4.7V	
11	0V	
12	2.6V	11
13	.8V	
14	2.4V	9
15	OV	
16	.08V	

(IC3)		
PIN	VOLTAGE	NOTE
1	.4٧	
2	5.3V	
3	2.7V	1
4	1.5V	1
5	2.6V	2
6	3.7V	
7	1.4V	<b> </b>
8	.08V	
9	.18V	
10	1.3V	
11	5.3V	
12	2.4V	6
13	1.4V	
14	2.6V	3
15	00	
16	.08V	

	(IC4)		
PIN	VOLTAGE	NOTE	
1	.4٧		
2	5.2V		
. 3	3.4V	12	
4	2.3V		
5	2.6V	10	
.6	3.7V		
7	.4٧		
8	.05V		
9	.05V		
10	.38V		
11	3V		
12	2.5V	11	
13	.76V		
14	2.1V	13	
15	0V		
16	.07V		

(IC5)		
PIN	VOLTAGE	NOTE
1	5.2V	
2	1.8V	14
3	.4V	
4	.09٧	
5	1.3V	
6	.03V	
7	.06V	
8	.07V	
9	.05V	
10	1.5V	
11	07	
12	.7V to 4.5V	1
13	.7V to 4.5V	1
14	.3V to 4.5V	1
15	.2٧	
16	.08V	

(IC6)		
PIN	VOLTAGE	NOTE
1	5.2V	
2	.7V to 4.5V	1
3	.03V	
4	2.6V	
5	0V	
6	.01V	
7	1.4V	
8	1.4V	
9	.0٧	
10	0٧	
11	.08V	
12	OV	
13	0V	
14	1.4V	
15	.9٧	
16	.4٧	·

PIN	VOLTAGE	NOTE
1	.17٧	
2	.03V	
3	00	
4	00	
5	OV	
6	5.2V	
7	0V	
8	0V	
9	.4٧	
10	0V to 5.2V	1
11	0V to 5.2V	1
12	.9V to 4.2V	1
13	0V	
14	5.2V	

TRANS	ISTOR	VOLTAGE	NOTE
Q1	E	0٧	
	В	.7٧	
	C	1V	
Q2	E	0V-	
	В	.7٧	
	C	0V	
Q4	E	0V	
	В	.35V to .65V	1
	C	0V to 5.2V	1
Q5	E	9.7V	
	В	9.7V	
	c	0V to .1V	1
Q13	E	0V	
	В	0V	
	C	5.2V	

#### NOTES:

VOLTAGES TAKEN WITH VTVM, GAME SWITCH IN MIDDLE (TENNIS) POSITION, PLAYERS SWITCH IN "2", SOUND ON, PLAYERS CENTERED AND "BALL" VOLLEYING BETWEEN, CHANNEL SWITCH ON 3.

- 1. Voltage varies with Ball Speed & Distance Traveled.
- 2. Voltage varies with Right or Left Ball Control.
- 3. Voltage varies with Left Wall Position Control.
- 4. Voltage varies with Lower Rebound Control.
- 5. Voltage varies with Upper Rebound Control.
- 6. Voltage varies with Goal Position Control.
- 7. Voltage varies with Right Wall Position Control.
- 8. Voltage varies with Right Player Horizontal Position.
- 9. Voltage varies with Left Player Horizontal Position.
- 10. Voltage varies with Right Player Vertical Position.
- 11. Voltage varies with Left Player Vertical Position. 12. Voltage varies with Right Fixed Player Position.
- 13. Voltage varies with Left Fixed Player Position.
- 14. Voltage varies with Blanking Centering & Width.

IC1

- A. Voltage Regulator
- B. Vertical Sync Generator
- C. Horizontal Sync Generator
- D. Right Wall Generator
- E. Rebound Circuitry

IC2

- A. Right Player Generator
- B. Left Player Generator

100

- A. Left Wall Generator
- B. Ball Generator

IC4

- A. Right Back Court Player Generator
- B. Left Back Court Player Generator

IC5

- A. Video Summer
- B. Video Output
- C. Audio Pulse Generator
- D. Logic Circuitry


IC6


A. Automatic Scoring Circuitry

IC.

A. Automatic Serving Circuitry

(SERVICE ADJUSTMENTS)





N P.C. BOARD (COMPONENT VIEW)

#### SERVICE ADJUSTMENTS

#### Horizontal Frequency Adjustment

- 1. Connect a Frequency Counter to Pin 16 of IC1.
- 2. Adjust the Horizontal Frequency Control (R2) for 15,734 Hz + or 30 Hz.

#### Vertical Frequency Adjustment

- 1. Connect a Frequency Counter to Pin 14 of IC1.
- 2. Adjust the Vertical Frequency Control (R4) for 60 Hz + or 1 Hz.

#### Blanking Width & Centering Adjustment

- 1. Connect an oscilloscope to the Composite Video Output at Pin 5 of IC5.
- 2. Apply +3 VDC bias to Pin 8 of IC5.
- 3. Adjust the Blanking Width Control (R70) for 16 usec. width (see Figure 1).
- 4. Adjust the Blanking Centering Control (R71) for 6 usec. before horizontal sync (see Figure 1).

#### Top & Bottom Rebound Adjustment

- 1. Connect 3 VDC bias to Pin 3 of IC3.
- 2. Rotate the Right Ball Control (R74) maximum counterclockwise and the Left Ball Control (R75) clockwise. NOTE: Only one control will have effect.
- 3. Adjust the Lower Rebound Control (R10) until the entire "Ball" is visible at the bottom of the screen.
- 4. Turn the Right Ball Control (R74) maximum clockwise and the Left Ball Control (R75) maximum counter-clockwise.
- 5. Adjust the Upper Rebound Control (R9) until the entire "Ball" is visible at the top of the screen. NOTE: Place the Game Switch to (Hockey) and the Player Switch to "4" for the following adjustments:

#### Right Wall Horizontal Position

1. Adjust the Right Wall Horizontal Control (R6) until the Right Wall is as close as possible to the right side of the screen and still fully visible.

#### Goal Opening Position

1. Adjust the Goal Opening Control (R14) until the goal openings in both walls are centered vertically.

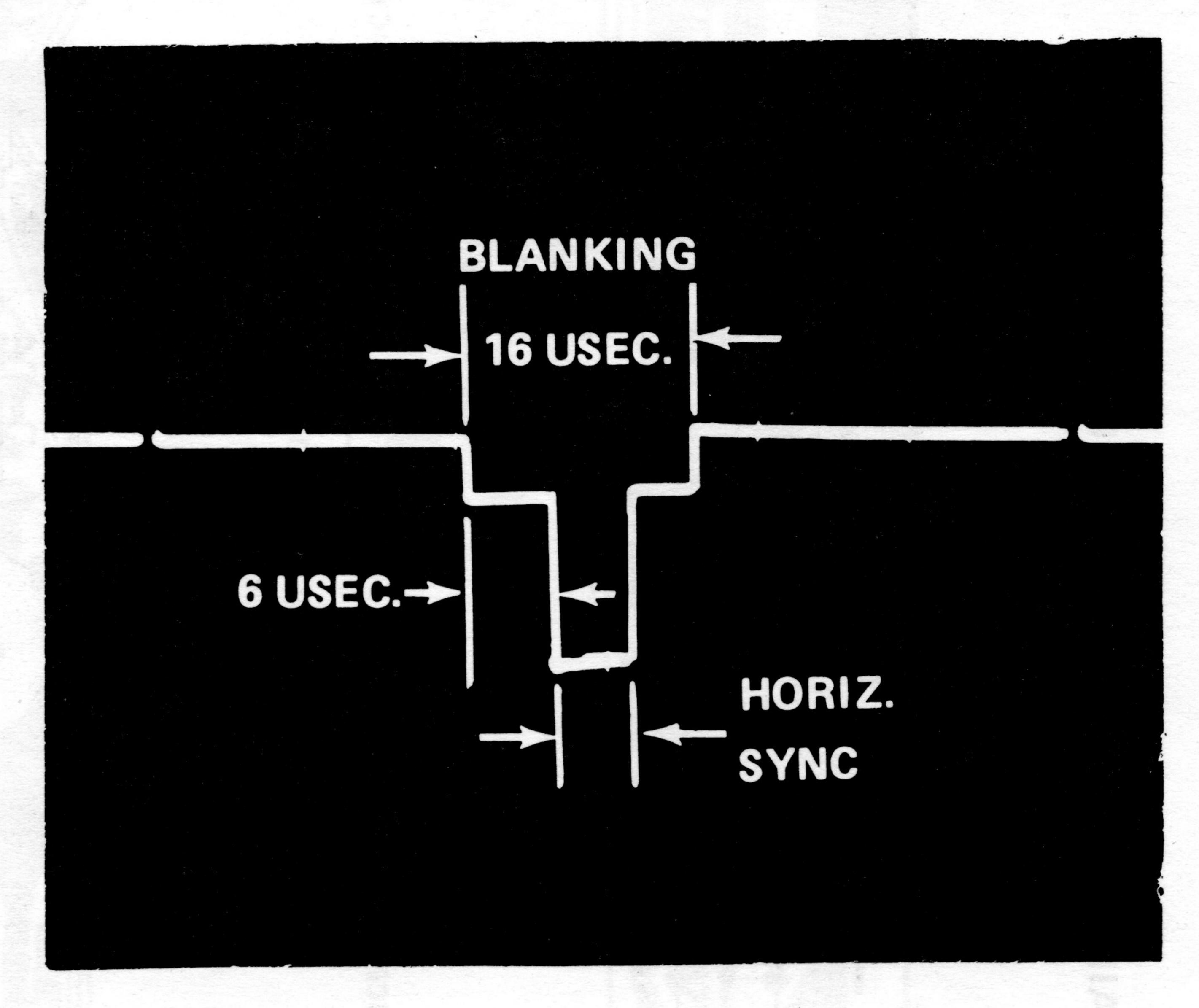



FIGURE 1

#### Score Indicator Position


1. Adjust the Scoring Oscillator Adjust (R77) until the indicators are equally spaced across the screen.


#### Right & Left Fixed Player Adjustment

- 1. Adjust the Left Fixed Player Horizontal Control (R33) until the player is approximately its width to the right of the left wall.
- 2. Adjust the Right Fixed Player Horizontal Control (R36) until the player is approximately its width to the left of the right wall.



#### BG7516 SCHEMATIC DIAGRAM





#### BG7516 REPLACEMENT PARTS LIST

Note: When ordering replacement parts please specify the part number as shown in this list including Description, Chassis, and Model Number. Complete information will help expedite the order. Replacement parts may occasionally differ in part number or value from the Factory installed part. In either event the replacement part has been chosen to provide equal or improved performance.

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	COILS & TRANSFORMERS			CONTROLS & SWITCHES	
L1	Oscillator Coil	361495-2	R2	Horizontal Frequency Adjust, 10K	220300-103
L2	12 uh Peaking Coil	361425-120	R4	Vertical Frequency Adjust, 150K	220300-154
L3	68 uh Peaking Coil	361475-680	R6	Right Wall Position, 100K	220300-104
T1	RF Transformer	361467-2	R8	Upper Rebound Position, 150K	220300-154
			R10	Lower Rebound Position, 150K	220300-154
	CAPACITORS		R14	Goal Position, 100K	220300-104
	Values, tolerances & voltage ratings		R29	R-F Level, 220 ohm	220300-221
	for capacitors not listed are shown on		R33	Left Fixed Player, 47K	220300-473
	the schematic, or are 10%, 500V.		R36	Right Fixed Player, 47K	220300-473
			R41	Right Player Horizontal, 25K	220337-5
22	Electrolytic, 470 mfd., 16V	270109-5215	R43	Left Player Horizontal, 25K	220337-5
23	Ceramic, 2200 pfd, 5%, 500V	250551-2225	R45	Right Player Vertical, 15K	220337-4
25	Polyester, 1000 pfd., 5%, 150V	250635-2225	R47	Left Player Vertical, 15K	220337-4
26	Polyester, .1 mfd., 10%, 100V	250654-1049	R51	Ball Speed, 50K	220311-10
29	Electrolytic, 220 mfd., 16V	270109-2215	R55	Left Wall Center, 100K	220311-11
210	Electrolytic, 22 mfd., 25 V	270111-2125	R70	Blanking Width, 100K	220300-104
11	Electrolytic, 22 mfd., 25 V	270111-2125	R71	Blanking Center, 4700 ohm	220300-472
12	Electrolytic, 2.2 mfd.,50V	270109-2050	R74	Right Ball Control, 50K	220337-6
13	Polyester, .47 mfd.,5%,11V	250600-13	R75	Left Ball Control, 50K	220337-6 220300-223
14	Ceramic, 2200 pfd.,5%,500V	250551-2225	R77 S1	Scoring Oscillator Adjust, 22K Power/On-Off Switch	160546-3
:17	Polyester, .47 mfd.,5%,11V	250600-13	S2	Player Select/Score Reset Switch	160546-3
:18	Ceramic, 2200 pfd.,5%,500V	250551-2225	1 00	Game Select Switch	160546-2
:19	Electrolytic, 2.2 mfd.,50V	270109-2050	S3 S4	Channel Select Switch	160556-1
24	Trimmer, 3-15 pfd.	250371-6	S5	Sound Defeat Switch	160556-1
225	Ceramic, 22 pfd.,5%,500V,NPO	250546-2205			
226	Ceramic, 20 pfd.,5%,500V,NPO	250546-2005		SEMICONDUCTORS	
229	Ceramic, 15 pfd., 10%, 500V, NPO	250546-1509			
230	Ceramic, 1.2 pfd., .1%,500V,NPO	250546-1296	D1	Germanium Diode	530105-100
33 34	Ceramic, 33 pfd.,5%,500V,NPO Ceramic, 27 pfd.,5%,500V,NPO	250546-3305 250546-2705	D3	Silicon Diode	530181-100
40	Polyester, .47 mfd.,5%,11V	250600-13	D4	Silicon Diode	530181-100
41	Ceramic, 2200 pfd., 5%, 500V	250551-2225	D6	Germanium Diode Detector	530065-100
42	Polyester, .47 mfd.,5%,11V	250600-13	D7	Germanium Diode Detector	530065-100
:43	Ceramic, 2200 pfd., 5%, 500V	250551-2225	D8	Germanium Diode Detector	530065-100
:44	Electrolytic, 2.2 mfd.,50V	270109-2050	D9	Germanium Diode Detector	530065-100
45	Electrolytic, 2.2 mfd.,50V	270109-2050	D10 D11	Silicon Diode Silicon Diode	530181-100
46	Electrolytic, 2.2 mfd.,50V	270109-2050	D12	Silicon Diode	530181-100
47	Electrolytic, 2.2 mfd., 50V	270109-2050	IC1	Voltage Reg./Sync. Generator	612086-1
48	Ceramic, 2200 pfd.,5%,500V	250551-2225	IC2	Player Generator	612087-1
49 50	Polyester, .47 mfd.,5%,11V	250600-13	1C3	Ball/Wall Generator	612088-1
51	Ceramic, 2200 pfd.,5%,500 V Polyester, .47 mfd.,5%,11 V	250551-2225 250600-13	IC4	Player Generator	612087-1
52	Electrolytic, 10 mfd.,25V	270111-1125	IC5	Video Summer/Logic	612089-1
56	Electrolytic, 47 mfd., 16 V	270111-5115	IC6	Scoring Logic	612108-1
59	Polyester, .1 mfd.,10%,100V	250654-1049	IC7	Auto Serve	612084-1
60	Polyester, .1 mfd.,10%,100V	250654-1049	Q1	NPN Silicon	610139-2
62	Electrolytic, 4.7 mfd.,50V	270111-5050	Q2	NPN Silicon	610232-2
63	Polyester, .1 mfd.,10%,100V	250654-1049	Q4	NPN Silicon	610232-2
64	Polyester, 1000 pfd.,5%,150V	250635-1025	0.5	PNP Silicon NPN Silicon	610083-2
65	Electrolytic, 10 mfd.,25V	270111-1125	Q13	INTIN SHICOH	010232-2
67	Polyester, .1 mfd.,10%,100V	250654-1049		MISCELLANEOUS	
74	Electrolytic, 47 mfd., 16 V	270111-5115		IVIIOCELETAIVEOCO	
76	Electrolytic, 47 mfd., 16 V	270111-5115	FB1,2	Ferrite Beads	364005-1
			111	External Power Jack	181139-2
	RESISTORS			Battery Connector	181096-3
	Values, tolerances & wattages for			Game Cable Assembly	461218-5
	resistors not listed are shown on the			Speaker (Ceramic Crystal)	560406-1
	schematic, or are 5%, ¼W.			Speaker Housing	181189-1

#### CABINET REPLACEMENT PARTS LIST

Note: When ordering replacement parts, please specify the part number as shown in this parts list including Description, Chassis Number, Model and Run Number. Complete information will help expedite the order.

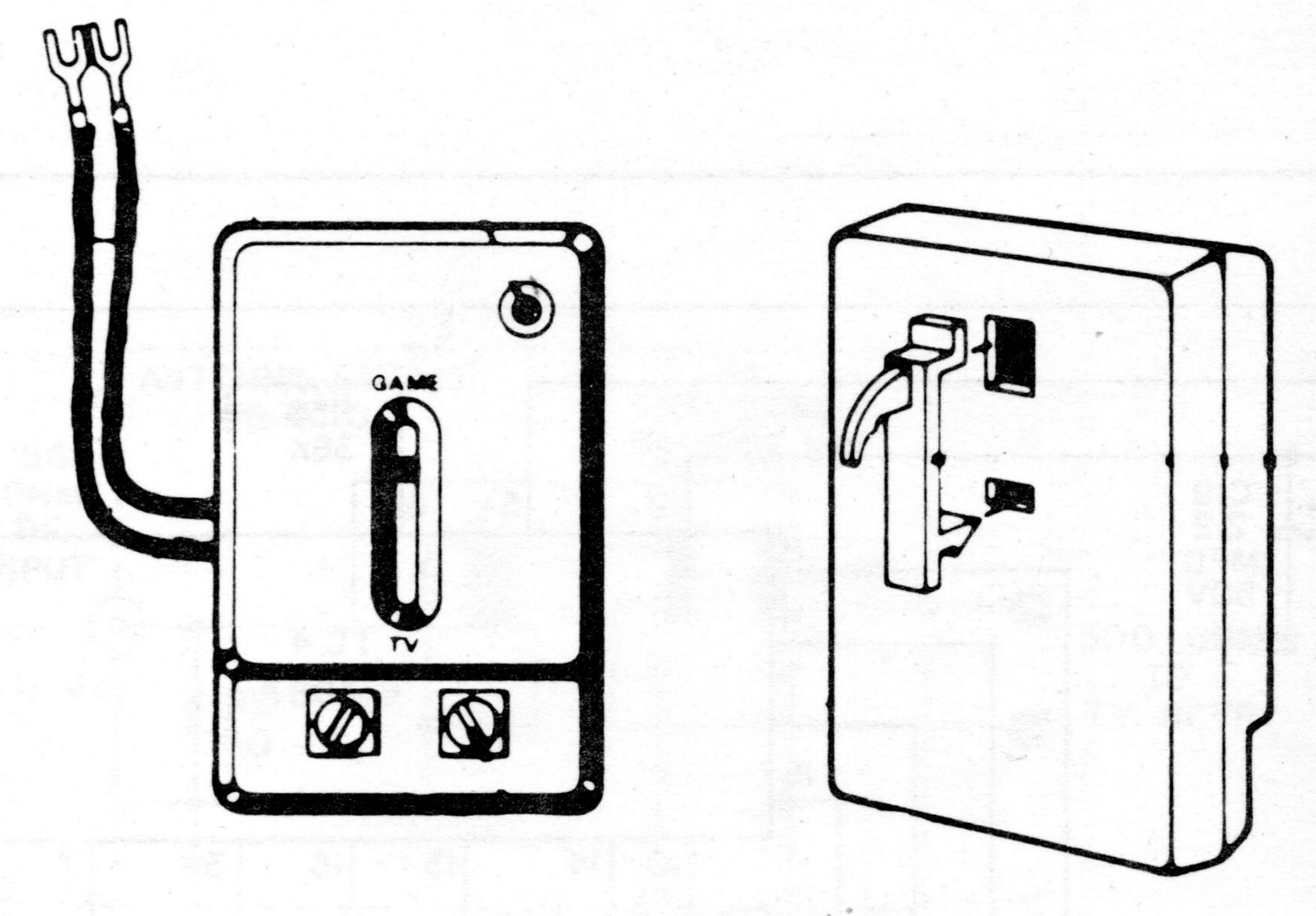
DESCRIPTION	PART NO.
Case, Top	143670-5
Case, Bottom	143669-5
Knob, Control	143689-8
Switch Inlay (Player Switch)	151449-1
Switch Inlay (Power Switch)	151449-2
Switch Inlay (Game Switch)	151449-3
Top Inlay	151483-2

DESCRIPTION	PART NO.
Chassis Cover (Cardboard)	643602-3
Battery Holder	142658-1
Foot, Black	141737-3
Spring Lock Nut	103235-1
Fastener Stud	732953-2
Retainer O-Ring	103082-4
Customer Operating Booklet	IB2985-1

## ANTENNA/GAME SWITCH REPLACEMENT PARTS LIST

### ANTENNA/GAME SWITCH

REF.	DESCRIPTION	PART NO.	
J1	Phono Socket	180902-4	
S1	Antenna/Game Switch	160499-2	
	Antenna Balun	361108-2	
	Case, Top	143676-1	
	Case, Bottom	143674-1	
	Plastic Hook	143719-1	
	Screw Terminal (2 used)	200495-1	
	Solderless Terminal (2 used)	200517-1	
	Game Cable Assembly	461218-5	
	Complete Antenna/Game Sw. Ass'y.	701702-3	



## SERVICE NOTES

# NAGNAVOX QUALITY IN EVERY DETAIL